

REMARKS

Claims 1-9 and 11-18 are pending in the application. Claim 10 has been canceled and its subject matter has been added in independent claim 9.

Claims 1-4, 6-8, 15 and 16 are rejected under 35 U.S.C. §102 as being anticipated by Wu (4,571,680).

Claim 5 is rejected under 35 U.S.C. §103 as being unpatentable over Fujimoto et al (6,238,291) in view of Wu (4,571,680).

Claims 9-12 are rejected under 35 U.S.C. §103 as being unpatentable over Goto (6,392,613) in view of Furuhashi (5,738,690) in view of Kudo et al. (6,560,692) in view of Saito (5,576,685).

Claims 13 and 14 are rejected under 35 U.S.C. §103 as being unpatentable over Goto (6,392,613) in view of Wu (4,571,680).

Claim 17 is rejected under 35 U.S.C. §103 as being unpatentable over Wu (4,571,680) in view of Saito. It should be noted that the Saito Patent No. is 5,576,685 as indicated in the Notice of References cited and not 5,805,883 (as mentioned in the Office Action).

Claim 18 is rejected under 35 U.S.C. §103 as being unpatentable over Goto (6,392,613) in view of Wu and further in view of Saito.

Independent claims 1, 2, 3; 4, 5, 6, 7, 9, 12, 13, and 14-18 have been herein amended to clarify applicant's claimed invention.

According to the present claimed invention as set forth in the amended independent claims, a period of the CPU interrupt signal is dynamically altered to T/n with respect to the period T of the sound data and the timing of the interrupt corresponds to the rise or fall of the

sound wave-form and due to this dynamic alteration of the interrupt period based on the sound waveform data of the original sound substantially eliminates discrepancy between the timing of the interrupt period and the timing of the rise and fall of sound waveform. The amendment has antecedent support in Fig. 8B of the drawings and page 17, lines 12-17 of the original specification.

The Examiner states that Wu teaches an electronic music page counting shoe having an interrupt service routine where the timer causes the interrupt to change based on frequency data obtained from the musical table of memory M9 and data from memory M6 (column 6 to column 7, line 27), which reads on "dynamically altering a period of a CPU interrupt signal in accordance with a sound data that is read from a CPU memory." The Examiner also indicates that n is 2 because there are 2 interrupts per cycle of the square wave.

Wu teaches an electronic music pace-counting shoe which sounds delight full music to entertain the walker. More specifically Wu (U.S. Patent No. 4,571,680) teaches that a memory M9 is used to store frequency data obtained immediately after checking a musical notation table and a memory M6 is used to store data about the number of square waves, which is obtained immediately after checking a musical meter table (column 5, lines 38-43). The content of memory M9 is multiplied by a value K to adjust the time interval of the interrupts (column 7, lines 22-26). The K value is a factor determining tempo of music or beat sound (column 6, lines 43-44). The walking speed can control the tempo of music or beat sound (column 7, lines 25-27).

However Wu neither teaches nor suggests any relationship between the timing of the interrupts and the rise or fall of the sound waveform. Further, Wu fails to teach that the two interrupts per cycle of the square wave meet with the cycle of the square wave.

In contrast, in the present invention as claimed the timing of the interrupt period meets with the timing of the rise and fall of sound waveform completely. Thus, the feature allows clear playback sound that is faithful to the original sound to be obtained (page 4, lines 3-4, English text).

Thus Wu neither disclose nor suggest the feature of this invention as claimed. Fujimoto et al. as applied against claim 5 discloses a game machine 400 which is played by connecting a home TV game machine with the portable game machines having displays. As shown in Fig. 3 of Fujimoto the game machine includes a CPU, an image circuit and acoustic circuit. No relationship between the timing of the CPU interrupt signal period and the timing of the rise and fall of the sound waveform is disclosed by Fujimoto either.

Thus claims 1-4, 6-8, 15-16 and 5 are patentably distinguishable over the art.

Goto applied against claims 9-12 discloses a portable electric device 100 (Fig. 9A), which includes a control 41 and a speaker 47.

Furuhashi (5,789,690) teaches an electronic sound source. A timer interrupt interval that is predetermined and stored in a timer interrupt interval storage 131 is selected to be 1/240 of a second when the system load is relatively low while the timer interrupt interval is selected to be 1/60 of a second while the system load is high (column 6, lines 52-58). This reference does not disclose or suggest the feature of the present claimed invention.

U.S. Patent No. 6,560,692 discloses a microcomputer 2 (Fig. 23). Kudo includes an interrupt controller 800 and a timer 960 that are connected to a clock timer 970. Saito (U.S. Patent No. 5,576,685) discloses a timer 40, which includes a presetable counter and is used for controlling time data when music information is played. The timer 40 downcounts preset data

based on play tempo data sent from a controller 30 and outputs an interrupt signal to controller 30 at a predetermined time interval (column 3, lines 21-27).

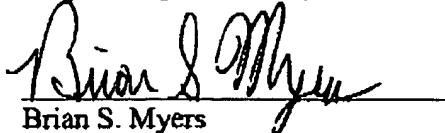
Neither Goto, nor Furuhashi, nor Kudo et al nor Saito taken singly or in combination suggest the present invention as recited in claim 9 and claims 11 and 12 dependent on claim 9.

Claims 13 and 14 rejected over Goto in view of Wu discussed above now include the same limitations as claims 1-4 and 9 and thus are also believed to be allowable. Claims 17 and 18 have been also amended to include the limitations regarding the relationship between the timing of the period of the CPU interrupt signal and the timing of the rise and fall of the sound waveform. The prior art references cited against claims 17 and 18 are discussed above.

In view of the foregoing it is respectfully submitted that claims 1-9 and 11-18 are allowable over the art. Passage of this application to allowance is earnestly solicited. However, if for any reason the Examiner should consider this application not to be in condition for allowance, the Examiner is respectfully requested to telephone the undersigned attorney at the number listed below prior to issuing a further Action.

Any fee due with this paper may be charged to Deposit Account No. 50-1290.

Respectfully submitted,



Brian S. Myers
Reg. No. 46,947

CUSTOMER NUMBER 026304
Telephone: (212) 940-8703
Fax: (212) 940-8986 or 8987
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